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U. S. DEPARTMENT of AGRICULTURE ★ SOIL CONSERVATION SERVICE WATER SUPPLY OUTLOOK FOR MONTANA

and
FEDERAL-STATE-PRIVATE COOPERATIVE SNOW SURVEYS
Collaborating with
MONTANA AGRICULTURAL EXPERIMENT STATION

AS OF
MAR. 1, 1979



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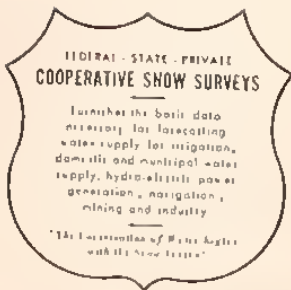
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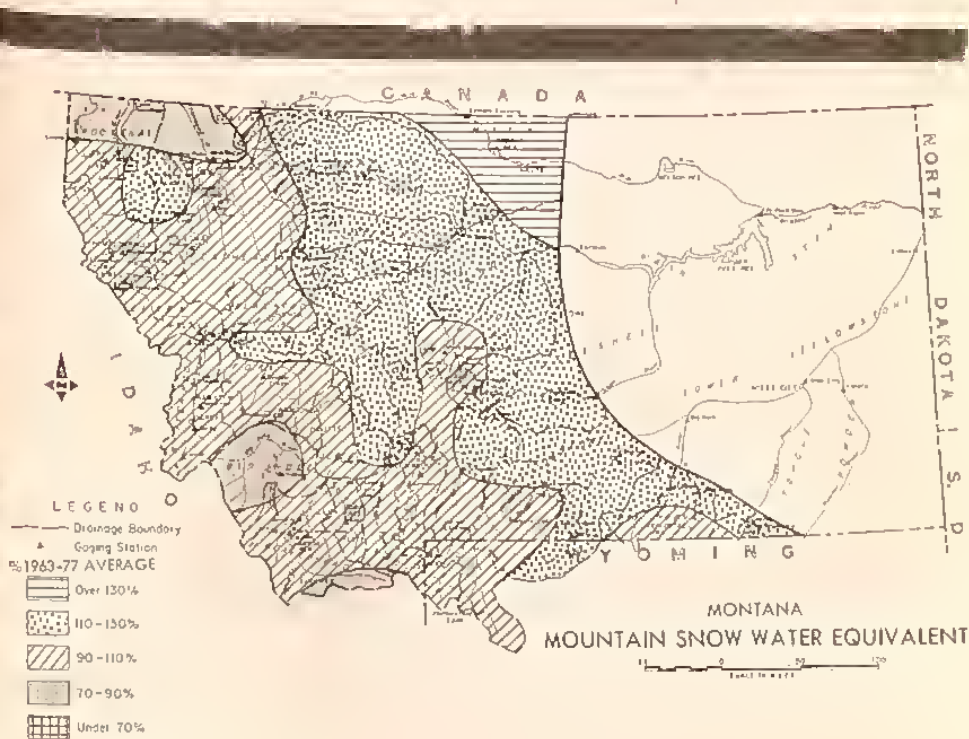
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MOUNTAIN SNOWPACK

The mountain snowpack conditions have improved during February. Many areas west of the divide have received well above average snowfall this month. Mountain watersheds along the Montana-Idaho border on the west side of the Bitterroot and Clark Fork River drainages received 15-18 inches of snow water equivalent during the past month. This would be equivalent to over 150 inches of snowfall. Most watersheds have recorded average or above average snowfalls for February with water content increases 5 to 10 inches common in high elevations. Moisture laden storms coming from the west and southwest, accompanied by warm temperatures provided good moisture increases in the mountain snowpack. Most areas now have average or above mountain snowpack. The Kootenai

River drainage north of Libby and the Flathead River drainage north of Kalispell, did not receive as much moisture as the more southerly areas and the mountain snowpack remains below average. The only other areas in the state showing below average conditions are the extreme southern part of the Red Rock River drainage south of Dillon and most of the Big Hole River drainage.

Foothill and valley areas on the east slope of the mountains east of the divide continue to show above average snowpack. Very heavy snowpack covers the Bear Paw and Little Rock Mountain near Havre. Cooperators also report that little melt has occurred in the valley areas and many areas still have considerable amounts of snow remaining.



WATER SUPPLY OUTLOOK

The outlook for spring and summer streamflow has improved. Good high elevation snowfall in February has increased runoff forecasts by 5-10 percent on most streams.

Most mountain drainages are now expected to produce between 90-100 percent of their average streamflow. Areas still below average include most of the Jefferson River drainage, the Kootenai and Yaak River drainages, the North Fork of the Flathead River, some small streams in the Upper Clark Fork drainage and the Missouri River.

Above average runoff is expected from the Bear Paw, Little Rocky, Highwood and Snowy Mountains and from most low elevations where snow pack is heavier than normal.

Late season irrigation water supplies should be adequate in most areas unless abnormal weather patterns develop in the next two or three months. Some shortages are projected for late season irrigation water in the Jefferson River tributaries without stored water.

Columbia River Drainage

STREAMFLOW FORECASTS

| BASIN, STREAM AND/OR FORECAST POINT | THIS YEAR | | | | PAST RECORD | | | | THIS YEAR | | | | PAST RECORD | | | |
|---|------------------------|-----------------------|------------------------|-----------------------|------------------------|-----------------------|------------------------|-----------------------|------------------------|-----------------------|------------------------|-----------------------|------------------------|-----------------------|------------------------|-----------------------|
| | FORECAST | | THOUSAND ACRE FEET | | FORECAST | | THOUSAND ACRE FEET | | FORECAST | | THOUSAND ACRE FEET | | FORECAST | | THOUSAND ACRE FEET | |
| | Estimated Acre Feet | Percent of Average | Estimated Acre Feet | Percent of Average | Estimated Acre Feet | Percent of Average | Estimated Acre Feet | Percent of Average | Estimated Acre Feet | Percent of Average | Estimated Acre Feet | Percent of Average | Estimated Acre Feet | Percent of Average | Estimated Acre Feet | Percent of Average |
| PERIOD | April - September | | | | April - July | | | | April - June | | | | | | | |
| Average based on 1963-1977 period. | | | | | | | | | | | | | | | | |
| KOOTENAI RIVER below Libby Dam (1) | 6,000 | 82 | 6,882 | 7,279 | 5,100 | 82 | 5,749 | 6,219 | | | | | | | | |
| FISHER RIVER near Libby | 262 | 97 | - | 270 | 247 | 98 | - | 253 | | | | | | | | |
| YAKA RIVER near Troy | 430 | 80 | - | 538 | 405 | 79 | - | 514 | | | | | | | | |
| KOOTENAI RIVER at Leona (1) | 7,200 | 81 | 8,436 | 8,883 | 6,300 | 82 | 7,207 | 7,727 | 5,100 | 83 | 5,618 | 6,150 | | | | |
| INFLOW MOULTON RESERVOIR nr Butte (Million Gallons) | | | | | 225 | 79 | 294 | 286 | 205 | 79 | 251 | 260 | | | | |
| WARM SPRINGS CREEK AT MEYERS DAM near Anaconda (2) | 42.6 | 84 | 33.7 | 50.7 | 34.0 | 83 | 23.8 | 41.2 | | | | | | | | |
| FLINT CREEK near Southern Cross (3) | 15.2 | 82 | 18.5 | 18.5 | 12.6 | 82 | 15.0 | 15.4 | | | | | | | | |
| FLINT CREEK below Boulder Creek (4) | 63.6 | 82 | - | 77.6 | 50.1 | 82 | - | 61.3 | | | | | | | | |
| INFLOW LOWER WILLOW CREEK RESERVOIR near Hall (5) | 14.5 | 86 | 13.7 | 16.9 | 13.7 | 86 | 12.8 | 16.0 | | | | | | | | |
| MIDDLE FORK ROCK CREEK near Phillipsburg | 70.8 | 90 | - | 70.0 | 64.0 | 90 | - | 71.1 | | | | | | | | |
| NEVADA CREEK near Finn | 22.2 | 94 | - | 23.6 | 20.6 | 94 | - | 21.8 | | | | | | | | |
| BLACKFOOT RIVER near Bonner | 940 | 92 | - | 1,017 | 850 | 92 | - | 920 | 735 | 93 | - | 794 | | | | |
| CLARK FORK RIVER above Milltown (6) | 840 | 100 | - | 843 | 740 | 102 | - | 730 | 630 | 103 | - | 613 | | | | |
| CLARK FORK RIVER above Missoula | 1,780 | 96 | 1,914 | 1,859 | 1,590 | 96 | 1,670 | 1,651 | 4,365 | 97 | 1,360 | 1,408 | | | | |
| WEST FORK BITTERROOT RIVER near Conner (7) | 173 | 93 | - | 187 | 162 | 94 | - | 172 | | | | | | | | |
| BITTERROOT RIVER near Darby | 590 | 98 | 707 | 602 | 550 | 100 | 647 | 552 | 475 | 99 | 545 | 480 | | | | |
| SKALKAHO CREEK near Hamilton | 53.6 | 93 | - | 57.4 | 47.0 | 94 | - | 49.8 | | | | | | | | |
| BURNIT FORD CREEK near Stevensville (8) | 35.6 | 92 | 35.5 | 38.8 | 31.2 | 93 | 29.2 | 33.6 | | | | | | | | |
| BITTERROOT RIVER at Missoula (9) | 1,530 | 99 | - | 1,543 | 1,430 | 101 | - | 1,416 | 1,230 | 102 | - | 1,211 | | | | |
| CLARK FORK RIVER below Missoula | 3,310 | 97 | - | 3,405 | 3,020 | 98 | - | 3,069 | 2,595 | 99 | - | 2,618 | | | | |
| CLARK FORK RIVER at St. Regis (HWS) | 4,250 | 94 | 4,710 | 4,521 | 3,840 | 94 | 4,219 | 4,078 | 3,280 | 94 | 3,468 | 3,492 | | | | |
| NORTH FORK FLATHEAD RIVER near Columbia Falls | 1,560 | 79 | - | 1,969 | 1,420 | 80 | - | 1,782 | 1,220 | 81 | - | 1,498 | | | | |
| MIDDLE FORK FLATHEAD RIVER near West Glacier | 1,880 | 98 | 1,935 | 1,911 | 1,730 | 99 | 1,711 | 1,750 | 1,470 | 100 | 1,402 | 1,470 | | | | |
| SOUTH FORK FLATHEAD RIVER near Columbia Falls | 2,240 | 97 | 2,367 | 2,302 | 2,100 | 97 | 2,205 | 2,159 | 1,850 | 98 | 1,872 | 1,884 | | | | |
| FLATHEAD RIVER at Columbia Falls (10) | 5,800 | 92 | 6,299 | 6,330 | 5,400 | 93 | 5,666 | 5,827 | 4,650 | 94 | 4,721 | 4,964 | | | | |
| SWAN RIVER near Big Fork | 655 | 96 | - | 681 | 580 | 97 | - | 596 | | | | | | | | |
| FLATHEAD RIVER near Polson (11) | 6,850 | 93 | 7,588 | 7,394 | 6,380 | 94 | 6,764 | 6,806 | 5,450 | 94 | 5,581 | 5,779 | | | | |
| CLARK FORK RIVER near Plains (11)(HWS) | 11,000 | 89 | 12,872 | 12,340 | 9,980 | 89 | 11,505 | 11,222 | 8,460 | 89 | 9,424 | 9,507 | | | | |
| THOMPSON RIVER near Thompson Falls | 253 | 96 | - | 263 | 227 | 97 | - | 234 | | | | | | | | |
| PROSPECT CREEK at Thompson Falls | 135 | 94 | - | 143 | 125 | 94 | - | 133 | | | | | | | | |
| CLARK FORK RIVER at Whitehorse Rapids (12)(HWS) | 12,300 | 89 | - | 13,781 | 11,200 | 89 | - | 12,519 | 9,450 | 89 | - | 10,633 | | | | |

- (1) Adjusted for storage in Lake Kootenai.
- (2) Adjusted for storage in Silver Lake, diversions to and pumping from Georgetown Lake.
- (3) Adjusted for storage in Georgetown Lake, diversions from and pumping.
- (4) Sum Flint Creek at Maxville and Boulder Creek at Maxville.
- (5) Sum of North Fork Lower Willow Creek near Hall and South Fork Lower Willow Creek near Hall.
- (6) Difference in observed flow Clark Fork above Missoula and Blackfoot near Bonner.
- (7) Adjusted for storage in Painted Rocks Reservoir.
- (8) Adjusted for diversion into Sunset Highline Canal.
- (9) Difference in observed flow Clark Fork above and below Missoula.
- (10) Adjusted for storage in Hungry Horse Reservoir.
- (11) Adjusted for storage in Hungry Horse Reservoir and Flathead Lake.
- (12) Adjusted for storage in Hungry Horse Reservoir, Flathead Lake and Noxon Rapids Reservoir.

(HWS) National Weather Service forecast.

SUMMARY of SNOW MEASUREMENTS

| COMPARISON WITH PREVIOUS YEARS | | | |
|---------------------------------------|----------------------------|--------------------------------------|---------|
| RIVER BASIN AND SUBWATERSHED | Number of Gauging Stations | THIS YEAR'S SNOW WATER AS PERCENT OF | AVERAGE |
| Kootenai/BC | 22 | 85 | 75 |
| Kootenai/Montana | 8 | 87 | 85 |
| Kootenai | 30 | 85 | 78 |
| Little Bitterroot | 5 | 105 | 127 |
| Flathead | 34 | 89 | 95 |
| Clark Fork above Blackfoot | 31 | 94 | 101 |
| Blackfoot | 17 | 93 | 106 |
| Clark Fork above Missoula | 48 | 94 | 103 |
| Bitterroot | 14 | 88 | 103 |
| Lower Clark Fork below Missoula | 11 | 94 | 97 |
| Clark Fork (Total w/o Flathead) | 73 | 92 | 102 |
| Pend O'Reille (Clark Fork & Flathead) | 107 | 91 | 99 |
| Columbia (Pend O'Reille & Kootenai) | 123 | 90 | 94 |

MOUNTAIN SNOWPACK

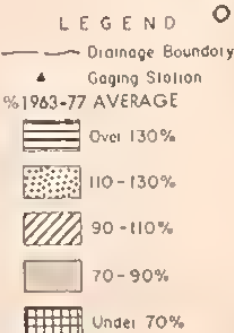
Snowfall during February was extremely heavy in the mountains on the west side of the Bitterroot and Clark Fork drainages along the Idaho-Montana border. Snow water equivalent increases of 15 to 18 inches were recorded. This would indicate over 150 inches of snowfall for February. In some areas the snow water equivalent for February was equal to the total amount that fell from November through January.

The snowpack is generally near average in most headwater drainages. Exceptions are the Kootenai River headwaters above Libby Dam, the Yaka River and the North Fork of the Flathead River where the snowpack is below average. The areas between Libby and Kalispell along the Kootenai-Flathead divide have above average snowpack. The area along the Clark Fork-Blackfoot divide continues to show above average snow.



The mountain snowpack continues to accumulate in high elevation watersheds. As this snow melts in the spring and summer it will be used for irrigation, recreation and power generation and by water fowl, fish and municipalities.

COLUMBIA RIVER DRAINAGE MONTANA MOUNTAIN SNOW WATER EQUIVALENT



WATER SUPPLY OUTLOOK

| COMPARISON WITH PREVIOUS YEARS | | | |
|--------------------------------|----------------------------|--------------------------------------|---------|
| RIVER BASIN AND SUBWATERSHED | Number of Gauging Stations | THIS YEAR'S SNOW WATER AS PERCENT OF | AVERAGE |
| Tobacco | fair | fair | |
| Little Bitterroot | ex | avg | |
| Mission Valley | avg | avg | |
| Flint Creek | avg | fair | |
| Upper Clark Fork | avg | avg | |
| Nevada Creek | ex | avg | |
| Blackfoot | avg | avg | |
| West-side Bitterroot | avg | avg | |
| East-side Bitterroot | avg | avg | |
| Bitterroot River | avg | avg | |
| Lower Clark Fork | avg | avg | |

STREAMFLOW FORECASTS

Spring and summer streamflow is forecast to be between 90-100 percent of average for most drainages. Somewhat lower runoff is expected on the North Fork of the Flathead, Kootenai and Yaka Rivers and some small tributaries in the Upper Clark Fork drainage. On these streams forecasts are in the 80-90 percent range, are higher than those issued last month, and are the result of well above normal snowfalls in February in most high elevation areas.

The outlook for irrigation water supplies is much improved over last month. Storm patterns for March are expected to continue from the west. Earlier this season most storms were from the north and did not produce normal snowfall in the mountains. If snowfall is average or above during March and April, most areas could expect near average irrigation water supplies.

Streamflow early in the season will be larger than usual in some drainages as the heavy, low elevation, snowpack melts.

Missouri River & Hudson Bay Drainages

STREAMFLOW FORECASTS

| BASIN, STREAM AND FORECAST POINT | | THIS YEAR | | PAST RECORD | | THIS YEAR | | PAST RECORD | | |
|--|--|--------------------|--------------------|--------------------|---------|--------------------|--------------------|--------------------|---------|--|
| | | FORECAST | | THOUSAND ACRE FEET | | FORECAST | | THOUSAND ACRE FEET | | |
| | | Thousand Acre Feet | Percent of Average | Lowest | Highest | Thousand Acre Feet | Percent of Average | Lowest | Highest | |
| Average based on 1963-1977 period. | | PERIOD | April - September | | | | April - July | | | |
| BEAVERHEAD RIVER near Grant (1) | | 120 | 70 | 117 | 171 | 105 | 71 | 96.4 | 148 | |
| BEAVERHEAD RIVER at Barratts (1) | | 162 | 72 | - | 226 | 140 | 71 | - | 196 | |
| RUBY RIVER near Alder | | 95.0 | 90 | - | 105 | 81.0 | 91 | - | 89.0 | |
| BIG HOLE RIVER near Melrose | | 630 | 80 | - | 792 | 580 | 79 | - | 730 | |
| BOULDER RIVER near Boulder | | 99.0 | 100 | 115 | 99.1 | 95.0 | 102 | 104 | 93.5 | |
| WILLOW CREEK near Harrison | | 17.0 | 79 | - | 21.5 | 15.4 | 80 | - | 19.2 | |
| MADISON RIVER near Grayling (2) | | 465 | 90 | 469 | 519 | 365 | 89 | 375 | 409 | |
| MADISON RIVER near McAllister (3) | | 815 | 91 | 853 | 892 | 657 | 93 | 685 | 706 | |
| GALLATIN RIVER near Gateway | | 515 | 90 | - | 572 | 438 | 90 | - | 488 | |
| INFLOW MIDDLE CREEK RESERVOIR near Bozeman (4) | | 26.2 | 87 | - | 30.1 | 23.0 | 88 | - | 26.0 | |
| HYALITE CREEK near Bozeman (5) | | 41.2 | 87 | - | 47.4 | 36.0 | 88 | - | 41.0 | |
| GALLATIN RIVER at Logan | | 550 | 85 | - | 649 | 473 | 85 | - | 557 | |
| MISSOURI RIVER at Toston (6)(HWS) | | 2,200 | 82 | 2,845 | 2,672 | 1,940 | 83 | 2,401 | 2,330 | |
| SHEEP CREEK near White Sulphur Springs | | 22.2 | 97 | 33.4 | 22.8 | 19.3 | 97 | 28.5 | 19.8 | |
| SUN RIVER at Gibson Dam (7) | | 545 | 94 | 661 | 578 | 500 | 94 | 596 | 529 | |
| BELT CREEK near Monarch | | 156 | 107 | - | 146 | 145 | 108 | - | 134 | |
| MISSOURI RIVER at Fort Benton (8)(HWS) | | 3,390 | 82 | - | 4,148 | 3,020 | 83 | - | 3,640 | |
| TWO MEDICINE CREEK near Browning (9) | | 246 | 95 | - | 259 | 235 | 96 | - | 244 | |
| BADGER CREEK near Browning | | 121 | 91 | - | 133 | 105 | 90 | - | 116 | |
| MARIAS RIVER near Shelby (HWS) | | 520 | 90 | 521 | 577 | 485 | 91 | 451 | 532 | |
| MISSOURI RIVER at Virgelle (10)(HWS) | | 3,980 | 83 | - | 4,794 | 3,560 | 84 | - | 4,238 | |
| SOUTH FORK JUDITH RIVER near Utica | | 14.2 | 95 | - | 14.9 | 13.2 | 97 | - | 13.6 | |
| MISSOURI RIVER near Landusky (10)(HWS) | | 4,410 | 85 | - | 5,215 | 3,900 | 85 | - | 4,586 | |
| NORTH FORK MUSSELSHELL RIVER near Delphine | | 6.2 | 97 | - | 6.4 | 5.3 | 96 | - | 5.5 | |
| SOUTH FORK MUSSELSHELL RIVER above Martinsdale | | 55.2 | 90 | - | 61.5 | 52.5 | 91 | - | 57.6 | |
| MISSOURI RIVER below Fort Peck Dam (11)(HWS) | | 4,320 | 88 | - | 4,929 | 3,850 | 88 | - | 4,381 | |
| MILK RIVER at Eastern Crossing (HWS) | | 301* | 108* | - | 278* | - | - | - | - | |
| MISSOURI RIVER near Wolf Point (12) | | 4,970 | 90 | - | 5,525 | 4,400 | 90 | - | 4,885 | |
| MISSOURI RIVER near Williston, North Dakota (13) | | 12,500 | 92 | - | 13,522 | 11,200 | 94 | - | 11,864 | |

SASKATCHEWAN RIVER BASIN

| | | | | | | | | |
|---------------------------------|-----|----|---|-----|-----|----|---|-----|
| ST. HARY'S RIVER near Babb (14) | 455 | 91 | - | 498 | 392 | 92 | - | 426 |
|---------------------------------|-----|----|---|-----|-----|----|---|-----|

*For the Period March - September.

WATER SUPPLY OUTLOOK

| STREAM & AREA | Flow Period | |
|--------------------|---------------|------------|
| | Spring Season | Low Season |
| Beaverhead | fair | fair |
| Ruby | avg | avg |
| Big Hole | avg | fair |
| Boulder | ex | avg |
| Jefferson | avg | fair |
| Madison | avg | avg |
| Gallatin | avg | fair |
| West-side Missouri | ex | avg |
| Smith-Belt | ex | avg |
| Sun | avg | avg |
| Teton | avg | avg |
| Marias | avg | avg |
| Judith | ex | avg |
| Musselshell | ex | avg |
| Milk | ex | avg |
| Bear Paws | ex | ex |
| St. Mary's | avg | avg |

Yellowstone River Drainage

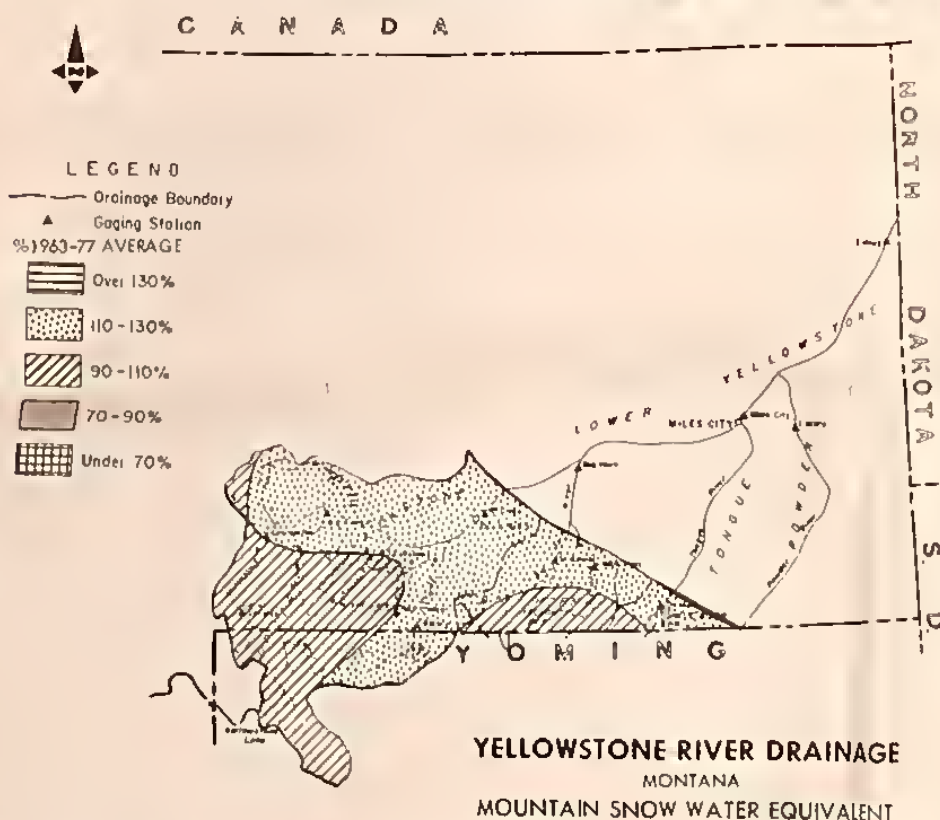
PROSPECTIVE STREAMFLOW FORECASTS

| BASIN, STREAM MILE, FORECAST POINT | THIS YEAR | | | | PAST RECORD | | | |
|------------------------------------|-----------|--------------------|-----------|--------------------|-------------|--------------------|-----------|--------------------|
| | FORECAST | PERCENT OF AVERAGE | LAST YEAR | PERCENT OF AVERAGE | FORECAST | PERCENT OF AVERAGE | LAST YEAR | PERCENT OF AVERAGE |

| Average based on 1963-77 period | | | | | | | | |
|------------------------------------|-----------|--------------------|-----------|--------------------|-------------|--------------------|-----------|--------------------|
| BASIN, STREAM MILE, FORECAST POINT | THIS YEAR | | | | PAST RECORD | | | |
| | FORECAST | PERCENT OF AVERAGE | LAST YEAR | PERCENT OF AVERAGE | FORECAST | PERCENT OF AVERAGE | LAST YEAR | PERCENT OF AVERAGE |

- (1) Adjusted for storage in Myrtle Lake.
- (2) Adjusted for storage in Conroy Reservoir.
- (3) Adjusted for storage in Buffalo Bill, Boyean, Bull Lake, Pilot Butte and Bighorn Reservoirs.
- (4) Adjusted for storage in Bull Lake, Buffalo Bill, Boyean, Pilot Butte, Bighorn and Tongue River Reservoirs.
- (5) Adjusted for reservoirs shown in (4) and diversions into the Lower Yellowstone Canal.

(NWS) National Weather Service forecast.



WATER SUPPLY OUTLOOK

| STREAM or AREA | Spring | Summer | Autumn | Winter |
|---------------------------|--------|--------|--------|--------|
| Yellowstone at Livingston | avg | avg | avg | avg |
| Shields | avg | avg | avg | avg |
| Boulder | avg | avg | avg | avg |
| Sweetgrass - Big Timber | ex | avg | avg | avg |
| Stillwater | avg | avg | avg | avg |
| Rock Creek | avg | avg | avg | avg |
| Clark's Fork | ex | avg | avg | avg |
| Yellowstone above Bighorn | ex | avg | avg | avg |
| Bighorn | avg | avg | avg | avg |
| Little Bighorn | ex | avg | avg | avg |
| Tongue | ex | avg | avg | avg |
| Powder | ex | avg | avg | avg |
| Lower Yellowstone | ex | avg | avg | avg |

STREAMFLOW FORECASTS

Good snowfall during February has improved the outlook for spring and summer streamflow. Based on current snowpack, runoff is forecast to be near average on most drainages. Some low elevation areas can be expected to produce above average runoff early in the season as the heavy, low elevation, snowpack melts. Assuming that snowfall during the next two or three months remains normal or above, late season irrigation supplies should be adequate on most drainages.

MOUNTAIN SNOWPACK

Most higher elevations of the Yellowstone River headwaters have near average snowpack. Snow water content increases during February were generally 5 to 12 inches in higher elevations. In general lower elevations and valley areas have a heavier than usual snowpack. Snow in the north end of the Bighorn Mountains is also near average. The Crazy Mountains have above average snowpack.

SATELLITE SNOW COVER

Beginning this month the percentage of snow cover for the Missouri River drainage above Canyon Ferry Reservoir will be reported. This information is obtained from polar orbiting satellites, received and processed by the National Environmental Satellite Service (NESS) of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA).

Reports are provided once or twice weekly when not restricted by cloud cover. The snow mapping season begins in November and continues until the end of the snow melt season.

The Missouri River drainage above Canyon Ferry is one of about 30 drainages being mapped in the western U.S. The only other drainage being mapped in Montana is the Kootenai River above Libby Dam, however, most of this drainage is in Canada.

This information will be used to supplement data gathered from snow courses and SHOTEL sites. It will be particularly useful in determining snow covered areas in the valley and to determine the snow line during the melt period.

It should come as no surprise that the entire drainage above Canyon Ferry has been completely snow covered from mid-November through December and January, and for much of February.

PERCENT OF THE MISSOURI RIVER DRAINAGE ABOVE CANYON FERRY THAT HAS SNOW COVER

| Date | % Snow Cover |
|---------------|--------------|
| Nov. 1, 1978 | 9 |
| Nov. 14, 1978 | 98 |
| Dec. 6, 1978 | 100 |
| Dec. 10, 1978 | 100 |
| Dec. 19, 1978 | 100 |
| Jan. 1, 1979 | 100 |
| Jan. 8, 1979 | 100 |
| Jan. 14, 1979 | 100 |
| Jan. 23, 1979 | 100 |
| Jan. 29, 1979 | 100 |
| Feb. 4, 1979 | 100 |
| Feb. 20, 1979 | 98 |
| Feb. 27, 1979 | 96 |

SNOW SURVEY DATA

SNOW

| DRAINAGE BASIN MILE or SNOW COURSE | NAME | ELEVATION | DATE | THIS YEAR | | PAST RECORD | |
|------------------------------------|------|-----------|------|---------------------|-------------------------|---------------------|-------------------------|
| | | | | SNOW DEPTH (INCHES) | PERCENT COVER (PERCENT) | SNOW DEPTH (INCHES) | PERCENT COVER (PERCENT) |

SNOW

| DRAINAGE BASIN MILE or SNOW COURSE | NAME | ELEVATION | DATE | THIS YEAR | | PAST RECORD | |
|------------------------------------|------|-----------|------|---------------------|-------------------------|---------------------|-------------------------|
| | | | | SNOW DEPTH (INCHES) | PERCENT COVER (PERCENT) | SNOW DEPTH (INCHES) | PERCENT COVER (PERCENT) |

SNOW (Continued)

| DRAINAGE BASIN and/or SNOW COURSE | Elevation | THIS YEAR | | | PAST RECORD | |
|-----------------------------------|-----------|----------------|---------------------|------------------------|------------------------|---------|
| | | Date of Survey | Snow Depth (Inches) | Water Content (Inches) | Water Content (Inches) | |
| | | | | | Last Year | Remarks |
| SAWTELL MOUNTAIN (ID) | 8710 | 2/27 | 87 | 23.6 | 36.2 | 28.4 |
| SENTINEL CREEK | 8300 | 2/26 | 61 | 17.2 | 26.9 | 21.3 |
| SHOWER FALLS | 8100 | 2/27 | 63 | 17.7 | 23.9 | 21.4 |
| SHOWER FALLS PILLOW | 8100 | 2/27 | SP | 17.6 | 23.2 | 21.0 |
| SILVER RUN | 6630 | 3/01 | 28 | 4.6 | 4.6 | 4.5 |
| SILVER RUN PILLOW | 6630 | 3/01 | SP | 4.9 | 4.5 | - |
| SKALKAHU SUMMIT | 7260 | 2/27 | 71 | 22.4 | 28.4 | 23.9 |
| SKALKAHU SUMMIT PILLOW | 7260 | 2/27 | SP | 20.2 | 26.2 | - |
| SLAG-A-MELT LAKE | 8750 | 3/02 | 78 | 19.2 | 28.8 | 24.2 |
| SLIDE ROCK MOUNTAIN | 7100 | 2/27 | 50 | 14.8 | 15.7 | 15.2 |
| SMUGGLER MINE | 6960 | 2/28 | 35 | 8.0 | 12.3 | 8.5 |
| SOUTH FORK SHIELDS | 8100 | 3/05 | 73 | 24.6 | 27.6 | 21.3 |
| SPOTTEO BEAR MOUNTAIN | 7000 | 3/03 | 53 | 15.7 | 14.7 | 14.6 |
| SPUR PARK | 8000 | 2/28 | 64 | 19.6 | 25.0 | 19.2 |
| SPUR PARK PILLOW | 8100 | 2/28 | SP | 20.0 | 26.0 | 20.0 |
| STAHL PEAK | 6050 | 3/01 | 91 | 28.0 | 34.8 | 36.8 |
| STAHL PEAK PILLOW | 6050 | 3/01 | SP | 22.7 | 30.5 | 29.8 |
| STEAMBOAT POINT (WY) | 7500 | 2/22 | 28 | 7.2 | 8.1 | 6.8 |
| STEMPLE PASS | 6600 | 2/28 | 46 | 11.9 | 10.5 | 9.6 |
| STORM LAKE | 7780 | 2/27 | 42 | 10.3 | 12.3 | 11.6 |
| STRYKER BASIN | 6180 | 2/27 | 82 | 23.9 | 27.9 | - |
| STUART MILL | 6500 | 2/28 | 29 | 7.2 | 6.1 | 7.9 |
| STUART MOUNTAIN | 7400 | 3/01 | 85 | 28.9 | 36.9 | 34.6 |
| SUCKER CREEK | 3960 | 2/26 | 0 | .0 | 3.6 | .7 |
| SUGARLOAF | 7350 | 2/22 | 40 | 9.5 | 10.5 | 9.5 |
| SUNSLI (ID) | 5600 | 3/02 | 114 | 32.3 | - | 32.6 |
| SYLVAN PASS (WY) | 7100 | 3/02 | 46 | 11.6 | 17.8 | 11.9 |
| TARGHEE PASS (ID) | 7000 | 2/28 | 49 | 11.8 | 16.0 | 13.6 |
| TAYLOR ROAD | 4080 | 2/26 | 29 | 7.4 | 9.2 | 3.3 |
| TEN MILE LOWER | 6600 | 2/27 | 34 | 9.2 | 7.4 | 6.8 |
| TEN MILE MIDDLE | 6800 | 2/27 | 42 | 11.2 | 11.4 | 10.3 |
| TEN MILE UPPER | 8000 | 2/27 | 45 | 13.0 | 13.9 | 12.8 |
| TEPEE CREEK | 8000 | 3/02 | 59 | 13.4 | 16.6 | 14.0 |
| TEPEE CREEK PILLOW | 8000 | 3/02 | SP | 12.0 | 14.7 | 11.1 |
| THUMB DIVIDE (WY) | 7900 | 2/26 | 57 | 16.0 | 20.3 | 18.2 |
| TIMBERLINE CREEK | 8850 | 3/01 | 38 | 6.8 | 8.6 | 13.0 |
| TRAIL CREEK | 7090 | 3/04 | 39 | 9.4 | 10.2 | 7.3 |
| TRINKUS LAKE | 6100 | 3/04 | 108 | 38.0 | 42.3 | 40.2 |
| TV MOUNTAIN | 6800 | 3/01 | 60 | 18.6 | 19.3 | 17.2 |
| TWELVEMILE CREEK | 5600 | 2/28 | 67 | 23.5 | 24.2 | 21.1 |
| TWELVEMILE CREEK PILLOW | 5600 | 2/28 | SP | 16.6 | 19.6 | 17.7 |
| TWENTY-ONE MILE | 7150 | 2/25 | 55 | 14.5 | 22.2 | 16.6 |
| TWIN CREEKS | 3580 | 3/03 | 41 | 14.1 | 13.8 | 12.0 |
| TWIN LAKES | 6510 | 2/28 | 114 | 38.3 | 44.8 | 38.2 |
| TWIN LAKES PILLOW | 6400 | 2/28 | SP | 35.5 | 43.0 | 38.2 |
| UPPER HOLLAND LAKE | 6200 | 3/04 | 88 | 30.4 | 37.5 | 33.7 |
| VALLEY VIEW (ID) | 6500 | 2/28 | 59 | 14.9 | 17.2 | 15.6 |
| WALDHON | 5600 | 3/05 | 39 | 10.0 | 13.0 | 10.1 |
| WALDRON PILLOW | 5600 | 3/05 | SP | 8.8 | 9.4 | 10.1 |
| WARM SPRINGS | 8250 | 2/28 | 54 | 15.3 | 21.0 | - |
| WARM SPRINGS PILLOW | 8250 | 2/28 | SP | 16.5 | 24.2 | - |
| WEASEL DIVIDE | 5450 | 3/01 | 77 | 22.4 | 31.7 | 32.4 |
| WEST YELLOWSTONE | 6700 | 2/25 | 43 | 11.5 | 15.1 | 11.1 |
| WEST YELLOWSTONE PILLOW | 6700 | 3/02 | SP | 10.1 | 9.8 | 8.0 |
| WHISKEY CREEK | 6800 | 2/27 | 65 | 19.0 | 23.8 | 17.9 |
| WHISKEY CREEK PILLOW | 6800 | 2/27 | SP | 15.1 | 19.2 | 14.9 |
| WHITE ELEPHANT (ID) | 7700 | 2/27 | 74 | 18.7 | 31.6 | 18.4 |
| WHITE MILL | 8700 | 3/02 | 98 | 25.0 | 32.3 | 25.0 |
| WHITE MILL PILLOW | 8700 | 3/02 | SP | 23.1 | 30.0 | 20.8 |
| WHITE PINE RIDGE | 8850 | 3/04 | 30 | 6.5 | 4.0 | 4.6 |
| WILLOW CREEK | 6500 | 2/28 | 35 | 8.6 | 7.7 | 6.7 |
| WOLVERINE (WY) | 7650 | 2/27 | 49 | 15.8 | 16.2 | 10.7 |
| WRONG CREEK | 5700 | 2/28 | 52 | 14.8 | 16.2 | 13.4 |
| WRONG RIDGE | 6800 | 3/01 | 62 | 18.1 | 20.2 | 18.3 |

Average based on 1963-77 period. A - Aerial observation; water content estimated. SP - Snow Pillow observation; water content only. * Estimated from SNOTEL.



RESERVOIR STORAGE (Thousand Acre Feet) END OF MONTH

| Basin of Stream | RESERVOIR | Useful Capacity | Useful Storage | | |
|-----------------|--------------------|-----------------|----------------|-----------|----------|
| | | | This Year | Last year | Average |
| COLUMBIA | | | | | |
| Kootenai | Koocanusa | 5,694.0 | 2,329.0 | 1,591.0 | - |
| | Hungry Horse | 3,428.0 | 2,236.0 | 1,641.0 | 2,329.0 |
| Flathead | Flathead Lake | 1,791.0 | 625.6 | 681.2 | 1,009.0 |
| | Camas (4) | 45.2 | 18.5 | 3.3 | 24.5 |
| Clark Fork | Mission Valley (8) | 100.3 | 59.8 | 38.3 | 34.9 |
| | Georgetown Lake | 31.0 | 26.1 | 23.9 | 25.3 |
| | Lower Willow Creek | 4.9 | - | 1.3 | 1.2 |
| | Nevada Creek | 12.6 | 6.5 | 1.0 | 5.6 |
| Bitterroot | Noxon Rapids | 334.6 | 310.3 | 261.8 | 300.6 |
| | Painted Rocks | 31.7 | 13.9 | 3.9 | 21.3 |
| | Como | 34.9 | - | 13.0 | 13.7 |
| MISSOURI | | | | | |
| Beaverhead | Lima | 84.0 | - | - | 31.9 |
| | Clark Canyon | 328.9 | 156.6 | 159.0 | 141.4 |
| Ruby | Ruby | 38.8 | - | 29.8 | 27.4 |
| Madison | Hebgen Lake | 337.5 | 241.0 | 243.2 | 202.6 |
| | Ennis Lake | 41.0 | 34.6 | 35.4 | 37.6 |
| Gallatin | Middle Creek | 8.0 | - | - | 3.6 |
| | Canyon Ferry | 2,043.0 | 1,387.0 | 1,490.0 | 1,608.0 |
| Missouri | Hauser & Helena | 61.9 | 52.5 | 52.2 | 57.4 |
| | Lake Helena | 10.4 | 11.1 | 10.9 | 9.0 |
| | Holter Lake | 81.9 | 79.9 | 80.9 | 51.2 |
| | Fort Peck Lake | 18,910.0 | 16,760.0 | 14,000.0 | 13,110.0 |
| | Smith River | 10.6 | - | - | 6.3 |
| Musselshell | Newlan Creek | 12.4 | 9.7 | 3.9 | - |
| | Bair | 7.0 | - | - | 4.7 |
| | Martinsdale | 23.1 | - | - | 7.5 |
| Sun | Deadman's Basin | 72.2 | - | - | 46.6 |
| | Gibson | 99.0 | 70.9 | 26.7 | 42.2 |
| | Willow Creek | 32.2 | 25.2 | 16.6 | 19.5 |
| Marias | Pishkun | 32.0 | 19.6 | 18.9 | 17.4 |
| | Lower Two Medicine | 11.9 | - | - | - |
| | Four Horns | 19.2 | - | - | - |
| Milk | Swift | 30.0 | - | 9.7 | 17.9 |
| | Lake Frances | 111.9 | - | 28.1 | 78.3 |
| | Elwell (Tiber) | 1,347.0 | 530.0 | 518.8 | 576.8 |
| | Beaver Creek | 3.5 | 1.6 | 1.3 | - |
| | Fresno | 127.2 | 69.7 | 17.8 | 56.8 |
| | Nelson | 66.8 | 44.0 | 6.1 | 41.2 |
| HUDSON BAY | | | | | |
| St. Mary's | Lake Sherburne | 66.2 | 25.8 | 29.8 | 21.9 |
| YELLOWSTONE | | | | | |
| Stillwater | Mystic Lake | 21.0 | 15.1 | 5.0 | 7.9 |
| Clark's Fork | Cooney | 27.4 | 13.6 | 13.1 | 14.7 |
| Tongue | Tongue River | 68.0 | - | 30.9 | 32.6 |
| Big Horn | Big Horn Lake | 1,356.0 | 839.5 | 820.8 | 800.8 |

Average based on 1958-72 period.



Water from the mountain snowpack helps sustain agriculture in Montana's fertile valleys.

AGENCIES AND ORGANIZATIONS COOPERATING IN MONTANA SNOW SURVEYS

GOVERNMENT AGENCIES

Canada

Water Survey of Canada, Calgary, Department of the Environment
Water Resources Service, Department of Lands, Forests and Water Resources,
British Columbia
Alberta Environment, Edmonton, Alberta

Federal

Department of the Army - Corps of Engineers
Department of Agriculture - Forest Service
- Soil Conservation Service
Department of Commerce - NOAA
- National Weather Service
Department of Interior - Bonneville Power Administration
- Bureau of Indian Affairs
- Bureau of Reclamation
- Fish and Wildlife Service
- Geological Survey
- National Park Service

STATE AGENCIES

Montana Conservation Districts
Montana Department of Fish and Game
Montana Department of Natural Resources and Conservation
Montana State University - Agricultural Experiment Station
University of Montana - School of Forestry
DNRC - State Forester

PRIVATE ORGANIZATIONS AND INDIVIDUALS

Butte Water Company
Montana Power Company
The Anaconda Company
Big Sky of Montana
Jack & Scott Gravelly
Art Christenson
Jack Fenton

